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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,320	08/10/2001	Mohamed N. Darwish	M-11671 US	4685

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EXAMINER

ORTIZ, EDGARDO

ART UNIT PAPER NUMBER

2815

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/927,320	Applicant(s) DARWISH ET AL.	
	Examiner Edgardo Ortiz	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/29/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 32-35 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Hshieh (U.S. Patent No. 6,262,453). With regard to Claim 32, Hshieh discloses a first drain region (110), a body region (130) disposed on a first surface of said first drain region, a gate region (125) extending through said body region and partially into said first drain region, a source region (140) disposed between a first portion of said body region and a first portion of said gate region, a first insulative layer (120) disposed between said source region and said first portion of said gate region and between said body region and a second portion of said gate region, wherein said first insulative layer has a first thickness (column 4, line 48) and a second insulative layer (120')

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disposed at least partially between a first portion of said first drain region and a third portion of said gate region and adjacent to said first insulative layer, wherein said second insulative layer has a second thickness (column 4, lines 45-46) that is greater than said first thickness. See figure 4. The limitation "*wherein said second insulative layer is not formed by oxidizing said first drain region*", is a product by process limitation that does not patentably distinguish the claimed structure from that taught by Hsieh. The presence of process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product. In re Stephens 145 USPQ 656 (CCPA 1965).

With regard to Claim 33, Hsieh discloses a gate region (125) that comprises polysilicon (column 6, lines 10-12).

With regard to Claim 34, Hsieh discloses a highly conductive region (118) formed in said first drain region (110) adjacent to said third portion of the gate region (125). See figure 4.

With regard to Claim 35, Hsieh discloses a first insulative layer (120) that comprises an oxide (column 4, line 48).

With regard to Claim 39, Hsieh discloses a second insulative layer (120') that does not introduce substantial stress in said first drain region (110).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 36-38 and 40-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hshieh (U.S. Patent No. 6,262,453). With regard to Claims 36, 40, 46 Hshieh, as stated supra, essentially discloses the claimed invention but fails to teach that the second insulative layer is formed from the group consisting of phosphosilicate glass and borophosphosilicate glass. However, it would have been obvious to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Hshieh to include a second insulative layer formed from the group consisting of phosphosilicate glass and borophosphosilicate glass, since these are well-known materials in the semiconductor art and used for insulation purposes in trench-gated structures.

With regard to Claims 37, 38, 54 and 56, the claimed thickness values would have been obvious to someone with ordinary skill in the art, at the time of the invention, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regard to Claim 41, Hshieh discloses a first drain region (110) that comprises a semiconductor of a first conductive type (n).

With regard to Claim 42, Hshieh discloses a body region (130) that comprises a semiconductor of a second conductivity type (p).

With regard to Claim 43, Hshieh discloses a source region (140) that comprises a semiconductor of a first conductive type (n).

With regard to Claim 44, Hshieh discloses a second drain region (105) that is disposed on a second surface of said first drain region (110), wherein said second surface is opposite said first surface.

With regard to Claim 45, Hshieh discloses a second drain region (105) that comprises a semiconductor of a first conductive type (n).

With regard to Claim 4, Hshieh discloses a first drain region (110) that comprises a lightly doped n semiconductor (column 4, line 30).

With regard to Claim 48, Hshieh discloses a body region (130) that comprises a p-doped semiconductor (column 4, line 36).

With regard to Claim 49, Hshieh discloses a source region (140) that comprises a heavily n-doped semiconductor (column 4, line 34).

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With regard to Claim 50, Hshieh discloses a second drain region (105) disposed below said first drain region (110). See figure 4.

With regard to Claim 51, Hshieh discloses a second drain region (105) that is a heavily n-doped semiconductor (column 4, line 29).

With regard to Claim 52, Hshieh discloses a gate region (125) that comprises polysilicon (column 6, lines 10-12).

With regard to Claim 53, Hshieh discloses an n-doped semiconductor region (118) adjacent said fourth portion of said gate region (125). See figure 4.

With regard to Claim 55, Hshieh discloses an insulative layer (120') that does not introduce substantial stress in said first drain region (110).

Response to Arguments

3. Applicant's arguments with respect to claims 32-56 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edgardo Ortiz whose telephone number is 571-272-1735. The examiner can normally be reached on Monday-Friday (1st Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

E.O.
A.U. 2815
4/29/04


JEROME JACKSON
PRIMARY EXAMINER